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| **InfiniD Lab Preview**  **- 8th Grade -** |

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| Core Missions   * SEEd Strand 1 - Confinement * SEEd Strand 2 - Collapse * SEEd Strand 3 - Overgrowth * SEEd Strand 4 - Insurgent | Supplementary Missions   * Social Studies - Intolerance\* * Math - Anomaly\* |

Expectations

* SCHEDULE MISSION: Coordinate schedule with flight director based on when you will teach each standard
* INTRO YOUR LESSON: As you teach your lesson(s), reference the upcoming mission.
  + Minimum (5 to 10 minutes): share the power statement (found below) that shows students how the lesson will impact their mission.
  + Optimal (30 to 60 minutes): personally review “Mission Prep and Summary” and other mission resources to better tease the upcoming mission during classroom instruction when possible.
* ASSIGN ROLES: Follow instructions in teacher prep sheet (10 to 15 minutes)
* DEBRIEF: Follow instructions in teacher prep sheet (10 to 30 minutes)

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| **SEEd Strand 1 - Confinement** | |
| **SEEd Strand 8.1:** Matter and energy interact in the physical world  **SEEd 8.1.1:** Matter can be broken down into smaller and smaller pieces.  **SEEd 8.1.2:** The properties of a material determine its uses.  **SEEd 8.1.3:** A substance’s properties change during chemical reactions.  **SEEd 8.1.5:** Heat energy changes the state of a substance.  **SEEd 8.1.7:** Heat energy transfer affects the rate of a phase change. | **Key Prep**   * What happens to molecules when you heat or cool them |
| **Summary**  Students will be ambushed by pirates and need to escape before it is too late. | |
| **Example Power Statement**  *“You will be trapped forever unless you understand how molecules react to heat.”* | |

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| **SEEd Strand 2 - Collapse** | |
| **SEEd Strand 8.2:** Energy is stored and transferred in physical systems  **SEEd 8.2.1:** Use computational thinking to analyze data about the relationship between the mass and speed of objects and the relative amount of kinetic energy of the objects. | **Key Prep**   * The relationship between the mass and speed of objects and the relative amount of kinetic energy of the objects * New stars are formed as hydrogen (and other gasses) collapse together, which builds up potential energy. The potential energy then converts into heat which encourages the fusion of hydrogen into helium (nuclear fusion). |
| **Summary**  Students will travel to a collapsing nebula to save the UCS Bravado. They will need to use their understanding of kinetic energy to push asteroids into the Bravado, giving the ship enough energy to escape the nebula. | |
| **Example Power Statement**  *“The science ship is trapped, and will not last much longer. Your knowledge of kinetic energy is the only thing that will get them out alive.”* | |

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| **SEEd Strand 3 - Overgrowth** | |
| **SEEd Strand 8.3:** Life systems store and transfer matter and energy.  **SEEd 8.3.1:** When given the right resources, plants grow.  **SEEd 8.3.2:** The process of cellular respiration uses stored energy and rearranges matter to sustain life.  **SEEd 8.3.3:** Change in the resources of an ecosystem will affect the stability in the cycling of matter and flow of energy through an ecosystem.  **Math 8.MP.2:** Reason abstractly and quantitatively.  **Math 8.MP.7:** Look for and make use of structure.  **Math 8.EE.1:** Know and apply the properties of integer exponents to generate equivalent numerical expressions. | **Key Prep**   * Basic understanding of photosynthesis of plants * 5 elements that encourage bacterial growth * Water: Water is needed to help bacteria grow * Food: Bacteria needs a food source (ours grows rapidly because it takes advantage of endless photosynthesis of the algae) * Oxygen: Bacteria can either be anaerobic or aerobic (ours is aerobic) * Temp: Between 60 degrees and 110 degrees fahrenheit * Ph levels: 0 = acid, 14 = alkaline - Bacteria grow at neutral 4.5 - 10.0 * (Optional) Base 2 exponential functions |
| **Summary**  Students will visit a planet recently consumed by algae. (\*Secret\*) They will discover that the algae mutated to behave like bacteria, and will need to figure out how to keep it from spreading and reverse its effects. | |
| **Example Power Statement**  *“This planet was consumed by algae in only two weeks, and other planets are now at risk. You will need to understand algae and how it behaves as much as possible in order to succeed.”* | |

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| **SEEd Strand 4 - Insurgent** | |
| **SEEd Strand 8.4:** Interactions with natural systems and resources  **SEEd 8.4.1:** Geological processes affect the uneven distribution of resources.  **SEEd 8.4.2:** Per capita consumption affects the availability of natural resources.  **SEEd 8.4.3:** There are consequences for using natural resources.  **SEEd 8.4.4:** There are factors that affect regional climates and global temperatures. | **Key Prep**   * Examples of different resources and what people have done to obtain/protect them (oil, gold, etc) |
| **Summary**  Students will investigate recent attacks by an extremist group. They have been attacking Colonial sites on a planet currently being terraformed called Verdant. | |
| **Example Power Statement**  *“Our relationship with the people on this planet is extremely unstable, and your ability to understand how resources are valued will help us keep things from escalating to a point of no return.”* | |

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| **Social Studies - Intolerance\*** | |
| **Social Studies:** Impact of slavery, our role as a superpower, and social responsibility. | **Key Prep**   * Discuss ideas around what makes some civilizations more successful than others * Basic understanding of human rights |
| **Summary**  Students are being sent to investigate a wormhole that recently appeared in our space. They will encounter a escaped slave seeking asylum at the wormhole opening. | |
| **Example Power Statement**  *“Your ability to negotiate and your understanding of human rights will determine your survival in this mission.”* | |

\*This mission was written for a different grade, but has also been popular with this grade. Available upon request.

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| **Math - Anomaly\*** | |
| **Math:** Understand the connections between proportional relationships, lines, and linear equations. Define, evaluate, and compare functions.  **Social Studies 8.8.3:** Analyze the impact of social reforms on Americans during the 19th century. | **Key Prep**   * Be able to solve a single variable equation (XXX km, XXX m/s = time to impact) and/or compare large ratios * Importance of standing up for the rights of others |
| **Summary**  Save a planet from incoming asteroids by providing the planetary defense system with the unit of measurement needed to properly target the fragments. | |
| **Example Power Statement**  *“If you do not know how to solve equations, the people on this planet will not survive.”* | |

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